UNITED STATES PATENT AND TRADEMARK OFFICE

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10/767,778	01/30/2004	Yoshiko Yasuda	NITT.0180	5694

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EXAMINER
JAMI, HARES

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 December 2007*.
2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.
3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-19, 22 and 23* is/are pending in the application.
    4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5)☐ Claim(s) _____ is/are allowed.
6)☒ Claim(s) *1-19 and 22-23* is/are rejected.
7)☐ Claim(s) _____ is/are objected to.
8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.
10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.
    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
    a)☐ All   b)☐ Some * c)☐ None of:
      1.☐ Certified copies of the priority documents have been received.
      2.☐ Certified copies of the priority documents have been received in Application No. _____.
      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)
2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3)☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4)☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5)☐ Notice of Informal Patent Application
6)☐ Other: _____.

DETAILED ACTION

This is in response to the amendment filed on December 11, 2007.

Claims 1-19 and 22-23 are pending in this Action.

Response to Amendment

In response to the first Office Action, claims 1-2, 4-5, 8-9, and 12 have been amended, claims 20-21 had been preliminarily cancelled, and new claim 23 has been added.

The amendment regarding specification has been accepted.

Applicant's arguments with respect to claims 1-19 and 22 have been considered but are moot in view of the new ground(s) of rejection.

Claim Objections

Claims 2 and 5 are objected to because of the following typo error: the newly amended limitation of "indicted" has been misspelled. Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-19 and 22-23 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Saito et al. ('Saito', hereafter), US Publication No. 2004/0111441 A1

(filed on Dec. 9, 2002) in view of Sakurai, US Patent No. 5,093,779 (patent issue date:

Mar. 3, 1992) further in view of McBrearty et al. ('McBrearty', hereafter), US Publication

2002/0133681 A1 (published on Sep. 19, 2002), and further in view of Pitts, US Patent

No. 6,205,475 B1 (patent issuing date: Mar. 20, 2001).

Regarding claim 1,

Saito discloses a file replication method for creating, in a distributed file system

including a plurality of network storage apparatus (See Fig. 4, Saito) and a replication

system each connected to a network (Saito discloses a replication engine [i.e., system]

creating replica of files, see [0012], [0062], and Fig. 1, Saito) wherein the replication

system has a management table for managing attribute information of all files and all

directories in the network storage apparatus as a replication source (See Fig. 3 and

[0075], Saito), a partial copy of data stored in the network storage apparatus as the

replication source in the network storage apparatus as a replication destination (Saito

discloses "Delta Propagation" system creating a replica of a changed portion of a file

from a source node to the destination node, see [0113], Saito). Saito further discloses

receiving a file access request from a client (See [0012] and [0061], Saito). Further

more, Saito discloses preliminarily recording replication information for specifying a file

as a target of replication in the replication system (Saito discloses recording the file

name and directory ID as specifying the replicating files; also Saito discloses "gold

replica" files as core replicas that are used as target files for replication, See [0069]-[0070], and Fig. 2, Saito).

Saito discloses all the limitations as stated above. Saito further discloses a table for managing the attributes of replicas (i.e., files) stored on a network storage apparatus (See Fig. 3 and [0075], Saito). However, Saito does not clearly disclose managing attribute information of all files and all directories the storage apparatus. On the other hand, Sakurai discloses a computer file system, which is from the same field of endeavor of file access and file managing (they are classified under the same class 707)(See col. 1, lines 30 et seq., Sakurai). Sakurai discloses a "file management table" containing the attribute information of all files and directories of a file system (See Fig. 1-5, col. 1, line 35 et seq. and col. 2, lines 47 et seq., Sakurai). Therefore, it would have been obvious to one of ordinary skill in the art at time the invention was made to modify the teachings of Saito with Sakurai's system. A skilled artisan would have been motivated to incorporate the "file management table" containing the attribute information of all files and directories of a file system, as taught by Sakurai (See Fig. 1-5, col. 1, line 35 et seq. and col. 2, lines 47 et seq., Sakurai) into the table showing key attributes of a replica on a network storage device of Saito in order to include a file management table for managing attribute information of all files and all directories of the network storage as a replication source. The motivation for doing so would have been that a file management table facilitates locating files and directories and shows relationship between directories and files and their attributes on a computer system.

The combination of Saito in view of Sakurai discloses all the limitations as stated above. It further discloses the replication engine making decision (i.e., judging) on integration, updates, and request functions. Moreover, as stated above, it discloses the limitations of management table and replication information which is identity of the replicating files See [0069]-[0070], and Fig. 2-3, Saito). However, it does not clearly disclose that preliminarily recording information indicating whether or not each of the file and the directories stored in said first network storage apparatus is an object to be copied in said replication system. Moreover, it does not clearly discloses judging whether or not a replicating operation should be performed with execution of said file access request by using said management table and said replication information. On the other hand, McBrearty discloses a method of automatically generating and disbanding data mirrors according to workload conditions, which is from the same field of endeavor of data replicating (See [0009], McBrearty). McBrearty discloses "usage statistics" regarding the storage apparatus which is preliminarily collected by the system and is used for replication purpose, corresponds to the limitation of "preliminarily recording replication information"; the usage statistics (i.e., preliminarily recording replication information) is used to indicate to whether or not the volumes (which contain files and directories) should be mirrored (i.e., replicated) by the system (See [0009], Fig. 7, and [0037]-[0039], McBrearty). McBrearty further discloses judging by making decision that whether or not mirroring (i.e., replication) operation would be performed or not using the storage information (See [0009], McBrearty). McBrearty judges the performing the replication by using the collected usage statistics of a volume to

determine if the usage exceeds a threshold, if it exceeds, then the replication is

performed (See [0037]-[0039], McBrearty). Therefore, it would have been obvious at the

time the invention was made to further modify the teachings of the combination of Saito

in view of Sakurai with McBrearty's system. A skilled artisan would have been motivated

to incorporate the techniques of including "usage statistics" (i.e., preliminarily recording

replication information) indicating whether or not to replicate a volume (which contains

directories and files) and using judging whether or not a mirroring (i.e., replication) is

performed or not, as taught by McBrearty (See [0009], Fig. 7, and [0037]-[0039],

McBrearty) into the method step of making decision, managing attribute table, and

replication information including files and directories of the combination of Saito in view

of Sakurai in order to include preliminarily recording information (i.e., "usage statistics")

indicating whether or not each of the file and the directories stored in said first network

storage apparatus is an object to be copied in said replication system and judge

whether or not a replicating operation should be performed with execution of the file

access request by using the management table and the replication information. The

motivation for doing so would have been to increase the efficiency of the system by

reducing the overhead of replicating unnecessary data corresponding to the access

request.

The combination of Saito in view of Sakurai and further in view of McBrearty

teaches all the limitation as stated above. However, it does not clearly disclose

simultaneously transferring, if a result of said judgment is such that the replicating

operation should be performed, said file access request to said network storage

apparatus as the replication source and to said network storage apparatus as the

replication destination. On the other hand, Pitts discloses a request interceptor in

network nodes for determining local storage of file image satisfying predetermined

criteria, which is form the same filed of endeavor of replicating (i.e., imaging) of data

over network (See col. 6, lines 19-54, Pitts). Pitts discloses that the system

simultaneously transfers the data access request to multiple storages having the same

dataset, which are replica of each other (See col. 23, lines 59-67, Pitts). Therefore, it

would have been obvious at the time the invention was made to further modify the

teachings of the combination of Saito in view of Sakurai and further in view of McBrearty

with Pitts's system. A skilled artisan would have been motivated to incorporate the

technique of simultaneously transferring the data access request to multiple storages

having the same dataset, which are replica of each other, as taught by Pitts (See col.

23, lines 59-67, Pitts) into the method step sending the client access request to the

combination of Saito in view of Sakurai and further in view of McBrearty in order to

simultaneously transferring, if a result of said judgment is such that the replicating

operation should be performed, the file access request to a network storage apparatus

as the replication source and to the network storage apparatus as the replication

destination. The motivation for doing so would have been to increase the speed of the

system by accessing the closer network storage having the same data, which results in

reducing the amount time accessing the data.

        Regarding claim 2,

the combination of Saito in view of Sakurai further in view of McBrearty, and

further in view of Pitts discloses wherein said replication system contains

synchronization information indicative of whether or not contents of each of files and

directories that is indicated as an object to be copied, maintain consistency between the

network storage apparatus as the replication source and the network storage apparatus

as the replication destination and judges that the replicating operation should be

performed under a condition that said synchronization information indicates consistency

(Saito discloses the system may synchronously pushes the updates (i.e., synchronous

information) to all replicas which are indicative of that the content of replicas either file

and directories should be changes to maintain the consistency of the system [see

[0050], Saito]; and also McBrearty discloses judging whether replication is performed or

not [see [0009], McBrearty], which corresponds to the limitation of wherein said

replication system contains synchronization information indicative of whether or not

contents of a file and a directory, each as an object to be copied, maintain consistency

between the network storage apparatus as the replication source and the network

storage apparatus as the replication destination and judges that the replicating

operation should be performed under a condition that said synchronization information

indicates consistency in said judgment step).

Regarding claim 3,

the combination of Saito in view of Sakurai further in view of McBrearty, and

further in view of Pitts discloses wherein the judgment is performed in said judgment

step that the replicating operation should be performed under a condition that the

received file access request is a write request (Saito discloses that received file access

request might be a write request [see [0083], Saito]; and also McBrearty discloses

judging whether replication is performed or not [see [0009], McBrearty], which

corresponds to the limitation of wherein the judgment is performed in said judgment

step that the replicating operation should be performed under a condition that the

received file access request is a write request).

Regarding claims 4 and 6-7,

the scopes of claims 4 and 6-7 are substantially the same as claims 1-3,

respectively. Therefore, claims 4 and 6-7 are rejected on the same basis as set forth for

the rejections of claims 1-3, respectively.

Regarding claim 5,

t the combination of Saito in view of Sakurai further in view of McBrearty, and

further in view of Pitts discloses wherein said replication unit further includes a

consistency unit for maintaining consistency of the files and directories that is indicated

as an object to be copied, between the network storage apparatus as the replication

source and the network storage apparatus as the replication destination (Saito discloses

a consistency management (i.e., unit) for maintaining the consistency between files and

directories of a file system by maintaining a distributed graph of replicas for each file

between a network storage devices including source and target nodes, see [0069],

Saito).

Regarding claim 8,

the combination of Saito in view of Sakurai further in view of McBrearty, and

further in view of Pitts discloses wherein said replication information is at least one rule

indicating that a file having a specified user or group identifier, a file belonging to a

specified directory, or a file having a specified file identifier as an object to be copied as

preliminarily recorded (Saito disclose the file identification or ID of directory and

replicating file, see [0070], and Fig. 3, Saito).

Regarding claims 9-10,

the scopes of claims 9-10 are substantially the same as claims 1 and 3,

respectively. Moreover, Saito discloses an NFS file system as a virtualized-and-unified

file system (See [0060], Saito). Therefore, claims 9-10 are rejected on the same basis

as set forth for the rejections of claims 1 and 3, respectively.

Regarding claim 11,

t the combination of Saito in view of Sakurai further in view of McBrearty, and

further in view of Pitts discloses collecting a response to the file access request from

said network storage device storing therein said file and a response to the file access

request from said network storage as the replication destination and returning the

collected responses as one response to said client (Saito discloses that in response to

the client access request a replica is created and then the server returns the client

request by sends response from the "file F" (i.e., targeting file) or "replica of File F" (i.e.,

destination file), see [0012] and [0080], Saito).

Regarding claims 12-15 and 17,

the scopes of claims 12-15 and 17 are substantially the same as claims 9, 5, 11, and 2, respectively. Moreover, Saito teaches the limitation of a root-directory managing a structure of directories and files (See [0064], Saito). Also, McBrearty discloses a mapping table (i.e., unit) for network storages (See [0023], Saito). Furthermore, Pitts discloses the limitation of external file system by disclosing that the network may support different types of file system (See col. 12, lines 46-57, Pitts). Therefore, claims 9, 5, 11, and 2 are rejected on the same basis as set forth for the rejections of claims 1-3, respectively.

Regarding claim 16,

the combination of Saito in view of Sakurai further in view of McBrearty, and further in view of Pitts discloses wherein said judgment unit judges that replication should not be performed if the file access request is a read request and the file access request is not transferred to the external file system as the replication destination (Saito discloses that received file access request might be a read request [see [0083], Saito], which does not change the contents of a file; and also McBrearty discloses judging whether replication is performed or not [see [0009], McBrearty], which corresponds to the limitation of wherein said judgment unit judges that replication should not be performed if the file access request is a read request and the file access request is not transferred to the external file system as the replication destination).

Regarding claim 18,

the combination of Saito in view of Sakurai further in view of McBrearty, and

further in view of Pitts discloses a unit for holding master information indicating that the

files and directories managed by the unified management directory are masters,

wherein said judgment unit judges whether or not replication should be performed in

accordance also with the master information (Saito discloses a root-directory managing

the directories and files [see [0064], Saito]; Saito further discloses metadata file storing

information about files and directories [see [0147], Saito]; and also McBrearty discloses

judging whether replication is performed or not [see [0009], McBrearty], which

corresponds to the limitation a unit for holding master information indicating that the files

and directories managed by the unified management directory are masters, wherein

said judgment unit judges whether or not replication should be performed in accordance

also with the master information).

Regarding claim 19,

the combination of Saito in view of Sakurai further in view of McBrearty, and

further in view of Pitts discloses wherein said replication information includes not only

the rule but also information for identifying the virtualized-and-unified file system to

which the rule is applied (Saito discloses identifying of files by their "File IDs" to be

replicated as replication information [see Fig. 3], also Pitts discloses identifying a file

system by the "file system ID) in a network [see col. 10, lines 12-17, Pitts], which

corresponds to the limitation of wherein said replication information includes not only the

rule but also information for identifying the virtualized-and-unified file system to which

the rule is applied).

Regarding claim 22,

the combination of Saito in view of Sakurai further in view of McBrearty, and

further in view of Pitts discloses capacity management unit for periodically acquiring

respective disk capacities and amounts of disk use of said virtualized-and-unified file

system and said external file system as the replication destination and determining,

from said disk capacities and amounts of disk use, a disk capacity and an amount of

disk use which allow for replication (Saito implicitly discloses the limitation of capacity

management unit by disclosing that a membership module maintain status or other

nodes including available disk space using by files and file system, and replica is

remove by replication engine when a node runs out of space and reclaiming [i.e.,

acquiring] of disk space if a disk runs out of space, see [0064], 77, and [0098], Saito).

Regarding claim 23,

the combination of Saito in view of Sakurai further in view of McBrearty, and

further in view of Pitts discloses wherein said replication indicates whether or not each

of the files and the directories stored in said first network storage apparatus storage is

an object to be copied, was preliminarily set by an administrator and then recorded in

said replication system (Saito discloses that an administrator set the landmark (i.e.,

information and record the information in a configuration file in the replication system,

see [0065], last 8 lines, Saito).

Response to Arguments

Applicants' arguments with respect to claim 1 and other independent claims that prior art does not teach the limitation of " a management table for managing attribute information of all files and directories in the network storage apparatus as a replication source" have been considered but are moot in view of the new ground(s) of rejection, **US Patent No. 5,093,779**.

Regarding the Applicants' argument that the prior art does not teach the limitation of "preliminarily recording information indicating whether or not each of the file and the directories stored in said first network storage apparatus is an object to be copied in said replication system", the Examiner respectfully disagrees.

The Applicants do not specify in the specification that what exactly mean by "preliminarily recording information", there is not any definition for that limitation. Therefore, the Examiner interprets that limitation in the broadest and reasonable way. In the combination of Saito in view of Sakurai further in view of McBrearty, and further in view of Pitts, McBrearty equivalently disclose the limitation of "preliminarily recording replication information" by teaching the limitation of "usage statistics" regarding the storage apparatus which is preliminarily collected by the system and is used for replication purpose; the usage statistics (i.e., preliminarily recording replication information) is used to indicate to whether or not the volumes (which contain files and directories) should be mirrored (i.e., replicated) by the system (See [0009], Fig. 7, and [0037]-[0039], McBrearty). Therefore, the combination of Saito in view of Sakurai further in view of McBrearty, and further in view of Pitts teaches the limitation of "preliminarily

recording information indicating whether or not each of the file and the directories stored

in said first network storage apparatus is an object to be copied in said replication

system", as required by claim 1.

Regarding the Applicants' argument that the prior art does not teach the limitation

of "judging whether or not a replicating operation should be performed with execution of

said file access request by using said management table and said replication

information", the Examiner respectfully disagrees.

In the combination of Saito in view of Sakurai further in view of McBrearty, and

further in view of Pitts, McBrearty equivalently disclose the limitation of judging to

perform the replication based on "usage statistics" (i.e., replication information).

McBrearty discloses making decision that whether or not mirroring (i.e., replication)

operation would be performed or not, using the storage information, which is judging

whether to perform the replication (See [0009], McBrearty). McBrearty judges the

performing the replication by using the collected usage statistics of a volume, which is

replication information, to determine if the usage exceeds a threshold, if it exceeds, then

the replication is performed (See [0037]-[0039], McBrearty). Moreover, Sakurai

discloses the limitation of "file management table" (i.e., management table) (See Fig. 1-

5, and corresponding text, Sakurai). Thus, the McBrearty modifies the combination of

Saito and Sakurai to make decision on whether to perform the mirroring (i.e.,

replication) based on the "usage statistics" (i.e., replication information) and "file

management table" (i.e., "managing table). Therefore, the combination of Saito in view

of Sakurai further in view of McBrearty, and further in view of Pitts teaches the limitation

of ""judging whether or not a replicating operation should be performed with execution of said file access request by using said management table and said replication information", as required by claim 1.

Regarding the Applicants' argument that the prior art does not teach the limitation of "simultaneously transferring, if a result of said judgment is such that the replicating operation should be performed, said file access request to said network storage apparatus and to said second network storage apparatus", the Examiner respectfully disagrees.

In the combination of Saito in view of Sakurai further in view of McBrearty, and further in view of Pitts, Pitts discloses that the system simultaneously transfers the data access request to multiple storages having the same dataset, which are replica of each other (See col. 23, lines 59-67, Pitts). The combination of Saito in view of Sakurai further in view of McBrearty Pitts already discloses judging whether or not to perform the replication based on the replication information (i.e. "usage statistics") and management file (i.e., "file management table"). Adding the Pitts teaching, modifies said combination in way that if the combination decides to mirror (i.e., replicate) the files the decision should be simultaneously transferred to the source and the target device. Therefore, the combination of Saito in view of Sakurai further in view of McBrearty, and further in view of Pitts teaches the limitation of "simultaneously transferring, if a result of said judgment is such that the replicating operation should be performed, said file access request to said network storage apparatus and to said second network storage apparatus", as required by claim 1.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Point of Contact

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hares Jami whose telephone number is 571-270-1291. The examiner can normally be reached on Mon to Fri 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John E. Breene can be reached on 571-272-4107. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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USPTO Customer Service Representative or access to the automated information

system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

                                                          Hares Jami
                                                          Examiner
                                                          Art Unit 2162

/Hares Jami/
Examiner, Art Unit 2162
03/25/2008

/JEAN B. FLEURANTIN/
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